

State of Oregon  
Department of Environmental Quality

Memorandum

**Date:** January 29, 2016

**To:** Eva DeMaria, USEPA

**Through:** Keith Johnson, DEQ Northwest Region Cleanup Manager

**From:** Alex Liverman, Portland Harbor Stormwater Coordinator

**Subject:** **Draft** Source Control Decision & No Further Action Determination  
Brazil Motors and Controls, Inc.  
ECSI # 1026

### 1.0 Introduction

This memo presents the basis for the Department of Environmental Quality source control decision and no further action determination for the Brazil Motors and Controls, Inc. site, located at 4315 NW St Helens Road in Portland, Oregon.

Brazil completed a Voluntary Cleanup Pathway Final Report (Terra Hydr, 2015) focused on the stormwater pathway at the site in accordance with the 2005 *EPA/DEQ Portland Harbor Joint Source Control Strategy*, also known as the JSCS. The report provides information on removal of soil to address the stormwater pathway as well risk to occupational workers, in accordance with Oregon Revised Statutes (ORS) 465.200 et. seq. and Oregon Administrative Rules (OAR) Chapter 340, Division 122, Sections 010 through 115.

DEQ concludes from review of the Voluntary Cleanup Pathway Final Report and supporting documents in the administrative record that Brazil has identified and controlled upland sources of contamination from current and past operations such that contaminant transport pathways at the site do not pose a significant current or future threat to the Willamette River. Further, DEQ concludes that the site does not pose a significant risk to human health or the environment, and no further action is necessary.

### 2.0 Site Description

The Brazil site is located in an industrially zoned area of Portland, Oregon, near the intersection of NW St. Helens Road, NW Yeon Avenue and NW Kittridge Avenue, approximately 0.5 mile west of the Willamette River. The site covers approximately 1.44 acres comprised of approximately half steep wooded hillside at the lower edge of Forest Park. The developed half of the site includes north (approximately 4,250 square feet or 0.1 acre) and south (approximately 13,900 square feet or 0.3 acre) gravel lots on either side of a 10,600 square foot building. Historical aerial photos indicate equipment storage and vehicles in the outside lots at least since 1974, lessening in the 1990s, and that the north lot was empty by 2009 and the south lot was empty by 2012. Currently, the lots may be used for parking and the building is used for warehousing, retail and offices. The site location and developed layout are shown in **Figure 1**.

The wooded hillside includes a natural drainage feature that was redirected to a concrete channel along the site's south yard at some point in the past. A portion of the hillslope drainage still follows the former channel and currently flows in a depression through the site's graveled south lot, along a steeper planted area acting as a

demarcation of the topographic transition to a gentle slope toward St. Helens Road. The drainage from both the concrete channel and the on-site depression discharges into the City of Portland piped conveyance system at inlet AMZ 188, as shown in **Figure 2**, which discharges to the Willamette River through City of Portland outfall 19. A short section of pipe is shown on **Figure 2** connecting to AMZ 188 from the direction of the south lot. This pipe was determined to remain dry during storm events and a camera scope terminated approximately 23 feet from the catch basin connection.

Stormwater interfaces with the site in several ways. Large volumes flow from the steep slopes of the park and forested areas, though the drainage to the city conveyance system. Rain falling on the site infiltrates in gravel areas or flows to the drainage or St. Helens Road catch basins either overland or from roof drains directed toward the street. A single catch basin was discovered at the end of a trench drain along the base of the steep, forested area behind the north lot, which directed captured flow to an underground pipe along the northern boundary of the site toward the street. No connection was found to the City conveyance system and frequent ponding on the site and areas of the immediately adjacent lot indicated blockage of the pipe.

While depth to groundwater at the site is unknown, the site is within an area underlain by Columbia River Basalt. Investigation at the adjacent site, Tax Lot 100 that was formerly owned and remediated by Portland General Electric, encountered shallow groundwater at approximately 22 to 28 feet below the ground surface (Wohlers 2013), which is assumed to be similar at the Brazil site.

### **3.0 Site and Regulatory History**

Historical records indicate that the lot was initially developed with the existing building in 1914 (Terra Hydr 2015). Known operations at the site include Portland Sandblasting and Skeen Electric prior to 1964 and work on and sale of electric and other motors and components as Brazil and Company 1964-1986, Brazil Electric Motors 1986-2004, Tatoosh Investments LLC 2004-2007 and Silver Star LLC 2007 to present.

As documented in DEQ's Environmental Cleanup Site Information (ECSI) database, the Brazil site was added to database in 1990, though insufficient information was available to determine whether the site posed a threat to human health and the environment and a preliminary assessment was recommended.

After Portland Harbor was listed as a Superfund site in December 2000, Brazil received and responded to a 104e request for information from EPA.

As part of Portland Harbor upland source control site discovery efforts in City of Portland outfall basin 19, the City collected and analyzed catch basin sediment and stormwater in City conveyances receiving stormwater originating on the Brazil site beginning in 2003 until 2012. The City sampling indicated that polychlorinated biphenyls or PCBs may have been discharging into the City conveyance system in site stormwater, at levels in exceedance of Portland Harbor screening level values. In 2010, Brazil entered into an agreement with DEQ to join the Voluntary Cleanup Program to complete a stormwater source control evaluation at the site.

### **4.0 Summary of Site Investigations, Actions and Evaluations**

#### **4.1 Contaminants of Potential Concern.**

Based on sampling of stormwater conveyances the site discharges to, site soil samples and historical operations, PCBs and metals were contaminants of potential concern for transport from the site, though polycyclic aromatic hydrocarbons or PAHs and phthalate esters were also evaluated in soils at the site.

## 4.2 Investigation and Remedial Action

### 4.2.1 Nature and Extent of Contamination

In 2006, the City of Portland conducted sampling of stormwater solids in stormwater conveyance lines and catch basins that serve St. Helens Road and multiple sites and are located adjacent to and downpipe from the site. In adjacent and downpipe samples, PCBs were detected in line solids ranging in concentration from 24 µg/kg to 679 µg/kg, dieldrin at 9.2 µg/kg to 47.1 µg/kg and DDx components at 3.7 µg/kg to 290 µg/kg. In downpipe samples, zinc was detected at 208 µg/kg, lead at 27 µg/kg, copper at 64.3 µg/kg, PAHs at 189.5 µg/kg and bis(2-ethylhexyl)phthalate at 549 µg/kg (City of Portland 2007, 2010).

In 2011, Brazil collected and analyzed shallow soil samples from the north and south gravel lots, from areas determined to be potentially erodible, as shown in **Figure 3**. PCBs were detected in the north lot at 6080 µg/kg and in the south lot at 255 µg/kg (Coles 2011). The following metals were also detected in shallow soils in the north lot: cadmium at 13,200 µg/kg, chromium at 115,000 µg/kg, mercury at 124 µg/kg, nickel at 100,000 µg/kg, selenium at 12,400 µg/kg and zinc at 938,000 µg/kg; and in the south lot: arsenic at 8,970 µg/kg and lead at 151,000 µg/kg (Coles 2011). These data are presented as samples SS-1 (north lot) and SS-2 (south lot) in **Tables 1 and 2**.

In 2014, a Phase II Environmental Site Assessment, funded by the City of Portland Brownfield Program, was undertaken at the site. **Figure 4** shows sampling locations, which included 13 direct push borings of soil in the gravel lots to a depth of four and a half feet below ground surface, one composite of six discrete shallow (0 to 0.5 feet) soil samples from the forested areas, one solids sample from the single catch basin located at the base of the forested area behind the north lot, and investigation of a conveyance line running from the catch basin along the northern property boundary toward the street. The results of this sampling are presented in **Tables 1, 2 and 3** and the terminus of the conveyance line was not able to be determined.

### 4.2.2 Risk Assessment

The shallow soil sample composited from the forested areas of the site did not show any appreciable concentrations of contaminants. Because these forested areas are segregated from the developed portions of the site by fencing, DEQ determined that access to contaminated areas of the site by terrestrial ecological receptors was prevented. Therefore, DEQ did not further evaluate risk to ecological receptors.

While samples between two to four and a half feet were not achieved comprehensively throughout the site, there were only a few detections of contaminants below two feet. These deeper detections were always less than the concentrations detected between zero to two feet, indicating that concentrations decrease with depth. Since groundwater likely occurs at depths of 22 to 28 feet below ground surface, decreasing contaminant concentrations below two feet and the limited ability for the contaminants at issue to readily transport between media make it unlikely that groundwater under the site would be impacted by soil contamination found on the site.

For human health risk from site soil, DEQ determined that only two soil samples (DP-2 and DP 4) from the Phase II work and one sample from Brazil's source control investigation (all in the north lot) exceeded DEQ's direct contact occupational risk-based concentration for PCBs of 590 µg/kg. The 2001 Independent Cleanup Pathway Report for the property adjacent to the northern boundary of the site (former PGE-Forest Park, ECSI #2406) used the residential risk-based protective level in DEQ's *Generic Remedies* guidance for PCBs of 1,200 µg/kg as the basis for a No Further Action determination. Only Brazil's north lot sample and Phase II sample DP-2, at the

northern boundary of the site with this adjacent property, exceeded this 1,200 µg/kg residential risk-based protective level.

In the south lot, the Brazil sample and two of the Phase II samples slightly exceeded the DEQ occupational risk-based concentration for arsenic, but these were at or below the Portland basin regional background concentration of 8,800 µg/kg.

Several of the site soil samples in the north lot exceeded DEQ occupational risk-based concentrations by up to two orders of magnitude for arsenic, cadmium and lead, and therefore presented risk to workers at the site.

#### **4.2.3 Remedial Action**

Because of the potential risk to workers from metals in the north lot, DEQ concurred with the Phase II report recommendation of removal of the top 18 to 24 inches of soil from an area measuring approximately 2,800 square feet or 0.07 acre of the north lot. DEQ also required confirmation of flow and connection from the stormwater conveyance pipe from the site or abandonment of it. In 2015, Brazil obtained a City of Portland Site Development Permit. Work under the permit included installation of erosion control measures, excavation of soil directly into trucks, transportation of removed soil to the Chem Waste Management facility in Arlington (depending on hazardous levels of lead) or the Hillsboro Landfill, securing of the excavation area while confirmation samples will collected and analyzed and cutting and capping at the property boundary with the street of the only existing stormwater line that runs along the northern edge of the property. Post-excavation soil samples were then collected at the same locations (DP-1 through DP-7) as the Phase II north lot borings and, following review of the analytical results, DEQ provided approval for a geotechnical barrier and approximately 22 inches of gravel backfill to be placed to cover the newly exposed soil at the bottom of the excavated area. Post-excavation confirmation sampling results are presented in **Table 4**.

Following this sequence of remediation actions in the north lot, concentrations of cadmium and lead on the now covered soil at the bottom of the excavated area no longer exceeded the DEQ occupational risk-based concentrations. While arsenic levels now under the geotechnical fabric and 22 inches of gravel continue to exceed the DEQ occupational risk-based concentration, they are consistent with background levels, with the exception of one point (DP-6) that exceeded the Portland basin regional background concentration of 8,800 µg/kg.

#### **4.2.5 No Further Action Determination**

Although sampling at the depth of excavation indicated three sample points exceeded the DEQ occupational risk-based concentrations for arsenic (DP-6) and for PCBs (DP-3 and DP-6), DEQ concluded that soil impacts above occupational risk levels are spatially limited. This, coupled with placement of an isolating geotextile layer and 22 inches of gravel in the north lot, gives DEQ confidence that the completed removal action is protective overall. Therefore, no further action is currently needed to address contamination in soils at the site. Future development on the site, however, should proceed in consideration of the small area of residual contaminants left on the site below the fabric and gravel layers.

#### **4.3 Source Control Evaluation**

Because the site is located within the Portland Harbor Superfund Site, upland source control investigations were guided by the 2005 EPA/DEQ Joint Source Control Strategy for Portland Harbor. The objective of a source control evaluation is to determine whether existing and potential sources of contamination at the site have been identified and if additional characterization or source control measures are needed. When stormwater is a

potential pathway to mobilize contamination from the site to the river, these determinations generally rest upon demonstrating that site-related information provides sufficient support to make the following findings:

1. Existing and potential facility-related contaminant sources have been identified and characterized.
2. Contaminant sources were removed or are being controlled to the extent feasible.
3. Performance monitoring conducted after source control measures were implemented supports the conclusion that the measures are effective.
4. Adequate measures are in place to ensure source control and good stormwater management measures occur in the future (DEQ 2010).

The site is located approximately half a mile west of the Willamette River. Site groundwater is assumed to be located approximately 22 to 28 feet below ground surface, as found at the adjacent site. There are no interior floor drains within the buildings that could contribute to groundwater, contaminant impacts to site soil were limited in depth to 2 to 3 feet below ground surface, contaminants detected in site soils have limited ability to transition between media and the site lies half a mile from the river. For these reasons, the groundwater pathway was excluded from source control evaluation. Therefore, stormwater was the only pathway evaluated at the site for source control.

#### **4.3.1 Lines of Evidence Evaluation**

The site lacks stormwater collection and conveyance features, apart from drains from painted steel roofs directed to the street and a single north lot trench drain and catch basin to a non-functioning conveyance pipe. Therefore, erodible soils on the site were investigated as to the potential for overland flow of stormwater to transport contaminants from the north and south gravel lots to the street and subsequently into the City conveyance system, which eventually discharges to the Willamette River through City Outfall 19.

The Brazil and Phase II shallow soils sampling events provided results that were adequate to characterize potential sources that could be transported from the site, as shown in **Tables 1 through 4**.

In the south lot, lead and PCBs were found in two and one samples, respectively, at concentrations slightly exceeding Portland Harbor screening level values. In the north lot, several sampling points exceeded SLVs for arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc and PCBs. In addition, the north lot catch basin sediment exceeded SLVs for arsenic, cadmium, copper, lead, mercury, zinc and PCBs.

Because contaminants that were detected in one or more samples at concentrations exceeding applicable JSCS upland source control screening values, concentrations were compared to DEQ charts from *Appendix E: Tools for Evaluating Stormwater Data* found in DEQ 2010. This tool was created by compiling contaminant concentration data from many of the stormwater and stormwater solids samples collected at Portland Harbor-area heavy industrial sites. This data was used to create a series of charts that plot rank-order samples against contaminant concentrations, and are used to identify contaminant concentrations in samples that are atypically elevated. Concentrations falling within the upper/steeper portion of the curve are an indication that uncontrolled contaminant sources may be present at the site and that additional evaluation or source control measures may be needed. Concentrations that fall on the lower/flatter portion of the curve suggest that stormwater is not being unusually impacted by contaminants at the site, and while concentrations may exceed the risk-based SLVs, they are within the range found in stormwater from active industrial sites in Portland Harbor.

In the south lot, concentrations of all contaminants that exceeded SLVs fell on the flatter part of the associated rank-order curves of concentrations found in stormwater solids at other heavy industrial sites in Portland Harbor. Because these are site soil samples, rather than solids that had been mobilized and concentrated by a stormwater collection system, and that they were found at relatively low concentrations, provides a strong line of evidence that source control is not warranted in the south lot.

To prevent erosion of soils in the southern forested area and south lot from entering the City conveyance to the river, either via the drainage through the lot or by sheet flowing from the site, Brazil installed jute matting and plantings in the southernmost 1/3 of the south lot, which gradually slopes down and borders the drainage flowing through that lot.

In the north lot, several of the soil and catch basin solids samples that exceeded SLVs, also fell on the steeper portion of the rank-order curves, indicating that source control was warranted in this area of the site.

The abandonment of the stormwater line and soil removal in the north lot, as described above in Section 4.2.3 of this memorandum, was an appropriate action to eliminate the potential for contaminated soils to be transported from the site to the river through the City conveyance system serving City Outfall 19. Effectiveness of this measure was demonstrated by the lower concentrations of contaminants in post-excavation sampling and by isolation of lower residual contaminants by geotechnical fabric and approximately 22 inches of gravel backfill. As demonstrated by observations during unusually heavy rainfalls resulting in saturation conditions between October 2015 and January 2016, stormwater now infiltrates on site in clean gravel. Further, in the event that rainfall and saturation conditions intensify, any overland flow to the street conveyance system would occur without contacting contaminated soil.

#### **4.3.2 Source Control Decision**

Based on review of the file, DEQ concludes that this upland site is adequately characterized and soil removal eliminated the potential for stormwater to transport contaminants from the site. The property does not appear to be a current or reasonably likely future source of contamination to the Willamette River.

#### **5.0 References**

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